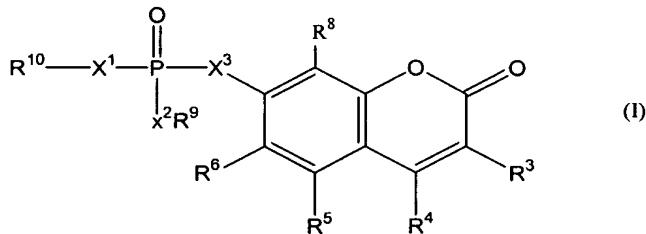


LISTING OF CLAIMS

1.-56. (Cancelled)

57. (Previously Presented) A compound of the formula I:



wherein

R^3 is selected from the group consisting of H, cyano, C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula $-(C=O)NR^1R^2$ where R^1 and R^2 are independently H, alkyl having 1-6 carbon atoms, an aryl, or R^1 and R^2 taken together form a saturated 5- or 6- membered ring having the formula $-(CH_2)_2-M-(CH_2)_2-$ where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine $-NR^7-$ where R^7 is H or alkyl having 1-6 carbon atoms;

R^4 is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C_1 - C_6 alkylamino, C_1 - C_6 acylamino, C_1 - C_6 alkylamido, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, C_1 - C_6 perfluoroalkyl, halomethyl, C_1 - C_6 alkylthio, C_5 - C_8 cycloalkyl, C_1 - C_6 haloalkyl, C_5 - C_8 halocycloalkyl, C_1 - C_6 hydroxyalkyl, C_5 - C_8 hydroxycycloalkyl, C_1 - C_6 alkoxy C_1 - C_6 alkyl, C_2 - C_6 alkoxy carbonyl, C_2 - C_6 alkoxy carbonyl C_1 - C_6 alkyl, carboxy C_1 - C_6 alkyl, carboxy C_1 - C_6 alkoxy, dicarboxy C_1 - C_6 alkyl, dicarboxy C_1 - C_6 alkoxy, C_2 - C_6 cyanoalkyl, phosphono C_1 - C_6 alkyl, phosphoryl C_1 - C_6 alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl,

cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R^5 is H or C_1 - C_6 alkoxy;

R^9 and R^{10} are ethyl;

R^6 and R^8 are halo; and

X^1 , X^2 , and X^3 are independently O or S.

58. (Previously Presented) The compound of claim 57, wherein R^4 is selected from the group consisting of H, cyano, sulfomethyl, salt of sulfomethyl, aryl, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, and C_1 - C_6 perfluoroalkyl.

59. (Previously Presented) The compound of claim 58, wherein R^4 is selected from the group consisting of C_1 - C_6 alkyl.

60. (Previously Presented) The compound of claim 59, wherein R^4 is methyl.

61. (Previously Presented) The compound of claim 57, wherein R^6 and R^8 are fluoro.

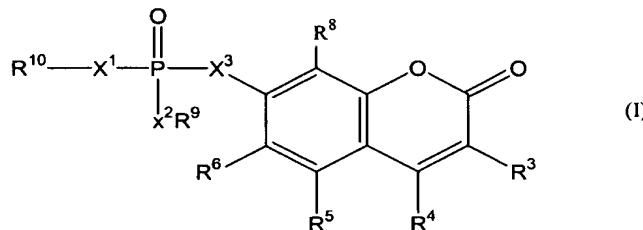
62. (Previously Presented) The compound of claim 57, wherein R^9 and R^{10} are ethyl, R^4 is methyl, and R^6 and R^8 are fluoro.

63. (Previously Presented) The compound of claim 57, wherein X^1 , X^2 , and X^3 are O.

64. (Previously Presented) The compound of claim 57, wherein X^1 , X^2 , and X^3 are S.

65. (Previously Presented) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme in a biological fluid, which contains at least organophosphatases and phosphatases, said method comprising:

(a) contacting the fluid with a compound of the formula I:



wherein

R^3 is selected from the group consisting of H, cyano, C_1 - C_6 alkyl, C_1 - C_6 perfluoroalkyl, C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula $-(C=O)NR^1R^2$ where R^1 and R^2 are independently H, alkyl having 1-6 carbon atoms, an aryl, or R^1 and R^2 taken together form a saturated 5- or 6- membered ring having the formula $-(CH_2)_2-M-(CH_2)_2-$ where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine $-NR^7-$ where R^7 is H or alkyl having 1-6 carbon atoms;

R^4 is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C_1 - C_6 alkylamino, C_1 - C_6 acylamino, C_1 - C_6 alkylamido, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, C_1 - C_6 perfluoroalkyl, halomethyl, C_1 - C_6 alkylthio, C_5 - C_8 cycloalkyl, C_1 - C_6 haloalkyl, C_5 - C_8 halocycloalkyl, C_1 - C_6 hydroxyalkyl, C_5 - C_8 hydroxycycloalkyl, C_1 - C_6 alkoxy C_1 - C_6 alkyl, C_2 - C_6 alkoxy carbonyl, C_2 - C_6 alkoxy carbonyl C_1 - C_6 alkyl, carboxy C_1 - C_6 alkyl, carboxy C_1 - C_6 alkoxy, dicarboxy C_1 - C_6 alkyl, dicarboxy C_1 - C_6 alkoxy, C_2 - C_6 cyanoalkyl, phosphono C_1 - C_6 alkyl, phosphoryl C_1 - C_6 alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R^5 is H or C_1 - C_6 alkoxy;

R⁹ and R¹⁰ are ethyl;

R⁶ and R⁸ are halo or hydrogen; and

X¹, X², and X³ are independently O or S;

(b) measuring the fluorescence of a fluorescent product formed during the contacting; and

(c) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

66. (Previously Presented) The method of claim 65, wherein the organophosphatase is paraoxonase.

67. (Previously Presented) The method of claim 65, wherein the organophosphatase is OPH.

68. (Previously Presented) The method of claim 65, wherein R⁹ and R¹⁰ are ethyl, R⁴ is methyl, R⁶ and R⁸ are fluoro, and X¹, X², and X³ are O.

69. (Previously Presented) The method of claim 65, wherein X¹ and X² are O, X³ is S, R⁶ and R⁸ are H; R⁹ and R¹⁰ are ethyl, and R⁴ is methyl.

70. (Previously Presented) The method of claim 65, wherein the fluid is a biological fluid.

71. (Previously Presented) The method of claim 70, wherein the biological fluid is selected from the group consisting of blood, blood-derived compositions, serum, cerebrospinal fluid, urine, saliva, milk, ductal fluid, tears, semen, cell or tissue extracts, culture medium from the expression of paraoxonase or mutations of paraoxonase, samples arising from the fractionation of paraoxonase or HDL from biological samples.

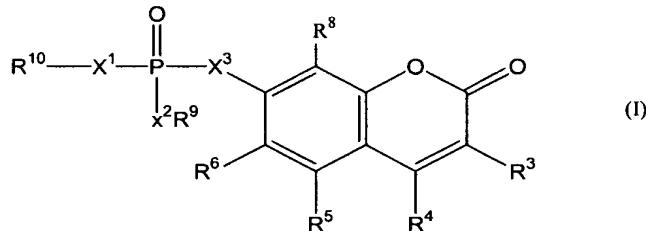
72. (Previously Presented) The method of claim 71, wherein the cell or tissue extract is of brain, artery, vein or gland.

73. (Previously Presented) The method of claim 70, wherein the fluid is an environmental fluid.

74. (Previously Presented) The method of claim 73, wherein the environmental fluid is an extract of soil, water, or swab.

75. (Previously Presented) A method for selectively detecting an organophosphatase in a sample suspected to contain an organophosphatase and a phosphatase comprising:

(a) contacting the sample with a compound of the formula I:



wherein

R³ is selected from the group consisting of H, cyano, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula -(C=O)NR¹R² where R¹ and R² are independently H, alkyl having 1-6 carbon atoms, an aryl, or R¹ and R² taken together form a saturated 5- or 6- membered ring having the formula -(CH₂)₂-M-(CH₂)₂- where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine -NR⁷- where R⁷ is H or alkyl having 1-6 carbon atoms;

R⁴ is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C₁-C₆ alkylamino, C₁-C₆ acylamino, C₁-C₆ alkylamido, C₁-C₆ alkyl, C₁-C₆ alkoxy, C₁-C₆ perfluoroalkyl, halomethyl, C₁-C₆ alkylthio, C₅-C₈ cycloalkyl, C₁-C₆ haloalkyl, C₅-C₈ halocycloalkyl, C₁-C₆

hydroxyalkyl, C₅-C₈ hydroxycycloalkyl, C₁-C₆ alkoxy C₁-C₆ alkyl, C₂-C₆ alkoxycarbonyl, C₂-C₆ alkoxycarbonyl C₁-C₆ alkyl, carboxy C₁-C₆ alkyl, carboxy C₁-C₆ alkoxy, dicarboxy C₁-C₆ alkyl, dicarboxy C₁-C₆ alkoxy, C₂-C₆ cyanoalkyl, phosphono C₁-C₆ alkyl, phosphoryl C₁-C₆ alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C₂-C₆ alkenyl, C₂-C₆ alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R⁵ is H or C₁-C₆ alkoxy;

R⁹ and R¹⁰ are ethyl;

R⁶ and R⁸ are halo or hydrogen; and

X¹, X², and X³ are independently O or S;

(b) measuring the fluorescence of a fluorescent product formed during the contacting; and

(c) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

76. (Previously Presented) The method of claim 75, wherein the organophosphatase is paraoxonase.

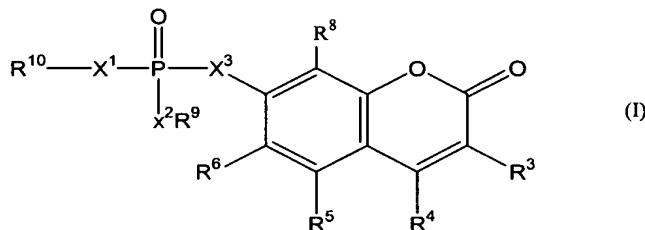
77. (Previously Presented) The method of claim 75, wherein the organophosphatase is OPH.

78. (Previously Presented) The method of claim 75, wherein R⁹ and R¹⁰ are ethyl, R⁴ is methyl, R⁶ and R⁸ are fluoro, and X¹, X², and X³ are O.

79. (Previously Presented) The method of claim 75, wherein X¹ and X² are O, X³ is S, R⁶ and R⁸ are H; R⁹ and R¹⁰ are ethyl, and R⁴ is methyl.

80. (Previously Presented) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme immobilized on a support, which comprises at least organophosphatases and phosphatases, said method comprising:

(a) contacting the support with a compound of the formula I:



wherein

R³ is selected from the group consisting of H, cyano, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, aryl, and heteroaryl, formyl, carboxamide of the formula -(C=O)NR¹R² where R¹ and R² are independently H, alkyl having 1-6 carbon atoms, an aryl, or R¹ and R² taken together form a saturated 5- or 6- membered ring having the formula -(CH₂)₂-M-(CH₂)₂- where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine -NR⁷- where R⁷ is H or alkyl having 1-6 carbon atoms;

R⁴ is selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C₁-C₆ alkylamino, C₁-C₆ acylamino, C₁-C₆ alkylamido, C₁-C₆ alkyl, C₁-C₆ alkoxy, C₁-C₆ perfluoroalkyl, halomethyl, C₁-C₆ alkylthio, C₅-C₈ cycloalkyl, C₁-C₆ haloalkyl, C₅-C₈ halocycloalkyl, C₁-C₆ hydroxyalkyl, C₅-C₈ hydroxycycloalkyl, C₁-C₆ alkoxy C₁-C₆ alkyl, C₂-C₆ alkoxy carbonyl, C₂-C₆ alkoxy carbonyl C₁-C₆ alkyl, carboxy C₁-C₆ alkyl, carboxy C₁-C₆ alkoxy, dicarboxy C₁-C₆ alkyl, dicarboxy C₁-C₆ alkoxy, C₂-C₆ cyanoalkyl, phosphono C₁-C₆ alkyl, phosphoryl C₁-C₆ alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C₂-C₆ alkenyl, C₂-C₆ alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl,

cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidine;

R^5 is H or C_1 - C_6 alkoxy;

R^9 and R^{10} are ethyl;

R^6 and R^8 are halo or hydrogen; and

X^1 , X^2 , and X^3 are independently O or S;

(b) measuring the fluorescence of a fluorescent product formed during the contacting; and

(c) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

81. (Previously Presented) The method of claim 80, wherein the organophosphatase is paraoxonase.

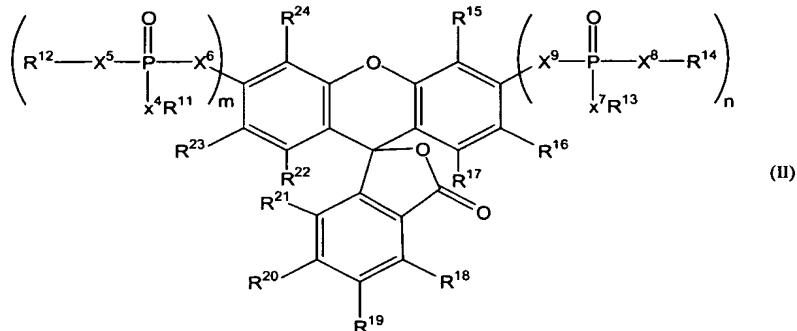
82. (Previously Presented) The method of claim 80, wherein the organophosphatase is OPH.

83. (Previously Presented) The method of claim 80, wherein the support is a membrane, resin, biosensor, microtiter plate, nanotube or dipstick.

84. (Previously Presented) The method of claim 80, wherein R^9 and R^{10} are ethyl, R^4 is methyl, R^6 and R^8 are fluoro, and X^1 , X^2 , and X^3 are O.

85. (Previously Presented) The method of claim 80, wherein X^1 and X^2 are O, X^3 is S, R^6 and R^8 are H; R^9 and R^{10} are ethyl, and R^4 is methyl.

86. (Previously Presented) A compound of the formula II:



wherein

R^{11} - R^{14} are selected from the group consisting of C_1 - C_6 alkyl, C_5 - C_8 cycloalkyl, C_1 - C_6 haloalkyl, C_1 - C_6 perfluoroalkyl, C_2 - C_6 alkenyl, and C_2 - C_6 alkynyl, and aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidino;

X^4 - X^9 are independently O or S;

n and m are 0 or 1 but m and n cannot be 0 simultaneously; and

R^{15} - R^{24} can be H or any substituent so long as the compound of formula II upon hydrolysis provides a fluorescent compound.

87. (Previously Presented) The compound of claim 86, wherein the hydrolysis takes place at the $P-X^6$ and/or $P-X^9$ bonds.

88. (Previously Presented) The compound of claim 86, wherein m and n are 1.

89. (Previously Presented) The compound of claim 86, wherein R^{15} - R^{24} are independently selected from the group consisting of H, hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, sulfomethyl, a salt of sulfomethyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, guanidino, C_1 - C_6 alkylamino, C_1 - C_6 acylamino, C_1 - C_6 alkylamido, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, C_1 - C_6 alkylthio, C_5 - C_8 cycloalkyl,

C_1 - C_6 haloalkyl, C_1 - C_6 perfluoroalkyl, formyl, carboxamide of the formula $-(C=O)NR^1R^2$ where R^1 and R^2 are independently H, alkyl having 1-6 carbon atoms, an aryl, or R^1 and R^2 taken together form a saturated 5- or 6- membered ring having the formula $-(CH_2)_2-M-(CH_2)_2-$ where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine $-NR^7-$ where R^7 is H or alkyl having 1-6 carbon atoms, an aryl, or R^1 and R^2 taken together form a saturated 5- or 6- membered ring having the formula $-(CH_2)_2-M-(CH_2)_2-$ where the ring moiety M is a single bond, an oxygen atom, a methylene group, or the secondary amine $-NR^7-$ where R^7 is H or alkyl having 1-6 carbon atoms, C_5 - C_8 halocycloalkyl, C_1 - C_6 hydroxyalkyl, C_5 - C_8 hydroxycycloalkyl, C_1 - C_6 alkoxy C_1 - C_6 alkyl, C_2 - C_6 alkoxy carbonyl, C_2 - C_6 alkoxy carbonyl C_1 - C_6 alkyl, carboxy C_1 - C_6 alkyl, carboxy C_1 - C_6 alkoxy, dicarboxy C_1 - C_6 alkyl, dicarboxy C_1 - C_6 alkoxy, C_2 - C_6 cyanoalkyl, phosphono C_1 - C_6 alkyl, phosphoryl C_1 - C_6 alkyl, mono-, di-, and trisaccharides, nucleic acids, oligonucleotides, amino acids, peptides, and proteins, and C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, aryl, arylcarbonyl, and heteroaryl, which may be optionally substituted with a substituent selected from the group consisting of hydroxyl, cyano, nitro, halo, amino, amido, azido, acetal, ketal, imido, sulfo, sulfonyl, sulfinyl, thiocyanato, aldehydo, keto, carbamoyl, urethane, ureido, and guanidino.

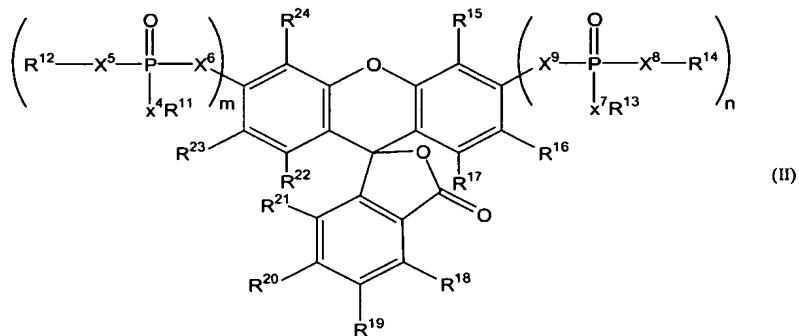
90. (Previously Presented) The compound of claim 86, wherein R^{11} - R^{14} are independently selected from the group consisting of C_1 - C_6 alkyl, C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, aryl, and heteroaryl.

91. (Previously Presented) The compound of claim 86, wherein R^{11} - R^{14} are independently selected from the group consisting of C_1 - C_6 alkyl, C_2 - C_6 alkenyl, and C_2 - C_6 alkynyl.

92. (Previously Presented) The compound of claim 86, wherein R^{11} - R^{14} groups are independently selected from the group consisting of C_1 - C_6 alkyl.

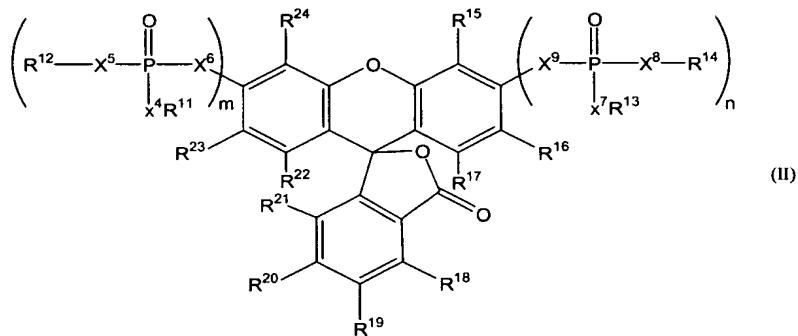
93. (Previously Presented) The compound of claim 86, wherein R^{11} - R^{14} is ethyl.

94. (Withdrawn) A compound of formula II



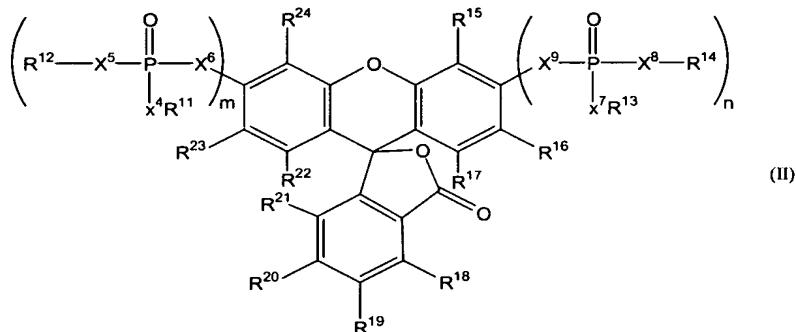
wherein X^4 - X^9 are O, R^{15} - R^{24} are H, R^{11} - R^{14} are ethyl; and m and n are 1.

95. (Withdrawn) A compound of formula II:



wherein X^4 , X^5 , X^7 , and X^8 are O; X^6 and X^9 are S; R^{15} - R^{24} are H; R^{11} - R^{14} are ethyl; and m and n are 1.

96. (Withdrawn) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme in a fluid, which contains at least organophosphatases and phosphatases, said method comprising:



(a) contacting the fluid with a compound of the formula II:

wherein R¹¹-R¹⁴ are selected from the group consisting of H and groups or atoms other than H, X⁴-X⁹ are independently O or S, n and m are 0 or 1 but m and n cannot be 0 simultaneously, and R¹⁵-R²⁴ can be H or any substituent so long as the compound of formula II upon hydrolysis provides a fluorescent product;

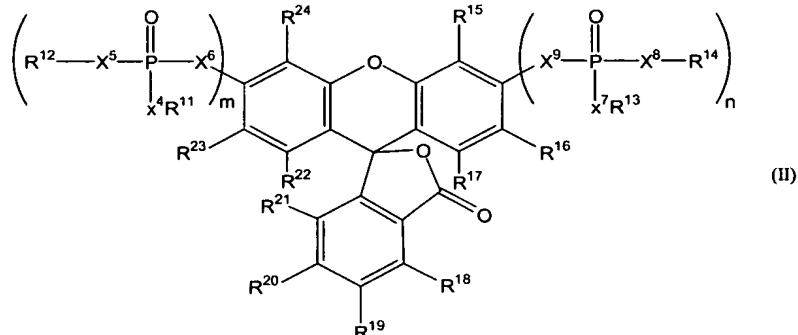
(b) collecting the fluorescent product;

(c) measuring the fluorescence of a fluorescent product formed during the contacting; and

(d) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

97. (Withdrawn) A method for selectively detecting an organophosphatase enzyme in a sample suspected to contain an organophosphatase and a phosphatase comprising

(a) contacting the sample with a compound of the formula II:

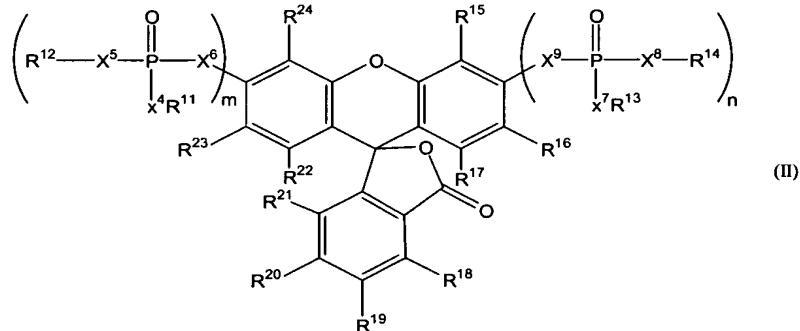


wherein R¹¹-R¹⁴ are selected from the group consisting of H and groups or atoms other than H, X⁴-X⁹ are independently O or S, n and m are 0 or 1 but m and n cannot be 0 simultaneously, and R¹⁵-R²⁴ can be H or any substituent so long as the compound of formula II upon hydrolysis provides a fluorescent product;

- (b) collecting the fluorescent product;
- (c) measuring the fluorescence of a fluorescent product formed during the contacting; and
- (d) correlating the measured fluorescence with the activity of the organophosphatase enzyme.

98. (Withdrawn) A method for specifically and selectively detecting and/or measuring the activity of an organophosphatase enzyme immobilized on a support comprising:

(a) contacting the support with a compound of the formula II:



wherein R¹¹-R¹⁴ are selected from the group consisting of H and groups or atoms other than H, X⁴-X⁹ are independently O or S, n and m are 0 or 1 but m and n cannot be 0 simultaneously, and R¹⁵-R²⁴ can be H or any substituent so long as the compound of formula II upon provides a fluorescent product;

(b) collecting the fluorescent product;

(c) measuring the fluorescence of a fluorescent product formed during the contacting; and

(d) correlating the measured fluorescence with the activity of the organophosphatase enzyme.